

4-22-05
HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

PATENT APPLICATION

ATTORNEY DOCKET NO. 10014777-3

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Roy Zeighami, et al.

Confirmation No.: 2132

Application No.: 10/687,382

Examiner: M. Datskovskiy

Filing Date: Oct. 16, 2003

Group Art Unit: 2835

Title: METHOD OF COOLING SEMICONDUCTOR DIE USING MICROCHANNEL
THERMOSYPHON

Mail Stop
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL LETTER FOR RESPONSE/AMENDMENT

Sir:

Transmitted herewith is/are the following in the above-identified application:

- () Response/Amendment () Petition to extend time to respond
() New fee as calculated below () Supplemental Declaration
() No Additional Fee
(X) OTHER: Information For Withdrawal Of Abandonment -- PTO Has No Evidence That Mailed Correspondence Received, Verified Statement Of Express Mailing Date, Exhibit A, B, C, and D, Return Post Cards

CLAIMS AS AMENDED BY OTHER THAN A SMALL ENTITY						
(1) FOR	(2) CLAIMS REMAINING AFTER AMENDMENT	(3) NUMBER EXTRA	(4) HIGHEST NUMBER PREVIOUSLY PAID FOR	(5) PRESENT EXTRA	(6) RATE	(7) ADDITIONAL FEES
TOTAL CLAIMS	6	MINUS	20	= 0	X \$50	\$ 0
INDEP. CLAIMS	1	MINUS	3	= 0	X \$200	\$ 0
[] FIRST PRESENTATION OF A MULTIPLE DEPENDENT CLAIM					+ \$360	\$ 0
EXTENSION FEE	1ST MONTH \$120.00	2ND MONTH \$450.00	3RD MONTH \$1020.00	4TH MONTH \$1590.00		\$ 0
OTHER FEES						\$
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT						\$ 0

Charge \$ 0 to Deposit Account 08-2025. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

"Express Mail" label no. EV413241607US

Date of Deposit Apr. 21, 2005

I hereby certify that this is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to: Commissioner for Patents, Alexandria, VA 22313-1450.

By

Typed Name: Melissa Smith

Respectfully submitted,

Roy Zeighami, et al.

By

Curtis A. Vock

Attorney/Agent for Applicant(s)

Reg. No. 38,356

Date: Apr. 21, 2005

Telephone No.: (720) 931-3011



PATENT
Attorney Docket No. 10014777-3
Express Mail Label No. EV413241607US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) Roy Zeighami, et al.

Serial No. 10/687,382

Filed October 16, 2003

For Method Of Cooling Semiconductor
Die Using Microchannel
Thermosyphon

Examiner M. Datskovskiy

Group Art No. 2835

Confirmation No. 2132

April 21, 2005

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**INFORMATION FOR WITHDRAWAL OF ABANDONMENT – PTO HAS NO
EVIDENCE THAT MAILED CORRESPONDENCE RECEIVED**

Dear Sir:

REQUEST

1. Applicant requests that the abandonment of this application be withdrawn.

PROMPTNESS OF THIS SUBMISSION

2. This information is being submitted promptly after applicant has learned of the abandonment on the basis of:

- ☒ the Notice of Abandonment mailed by the Office on April 13, 2005.
- ☐ applicant's own procedures in monitoring the progress of this case.

SUBMISSION

3. Submitted herewith is/are:

☒ a copy of the page of the response mailed on July 26, 2004, showing a Certificate of Mailing executed on July 26, 2004. Attached hereto as Exhibit A.

☒ A copy of the post card identifying the papers filed and showing the U.S. PTO receipt stamp dated July 26, 2004. Attached hereto as Exhibit B.

☒ A copy of the complete response previously filed. Attached hereto as Exhibit C.

☒ A copy of the Image File Wrapper printed from the U.S. Patent Office Patent Application Information Retrieval website showing the response mailed on July 26, 2004. Attached hereto as Exhibit D.

STATEMENT

4. Attached hereto is a statement attesting to the timely mailing of the correspondence referred to above based on:

- ☒ personal knowledge
☐ a showing believed to be satisfactory to the Commissioner

5. Please proceed with further examination of this application on the basis of:

- ☒ The original papers filed, which have now reached the appropriate area of the PTO.

AND/OR

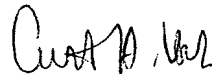
- ☒ The attached copy of the papers originally filed.

REQUEST FOR WITHDRAWAL OF ABANDONMENT

6. Acknowledgement of the active status of this application is respectfully requested.

Respectfully submitted,

LATHROP & GAGE LLC



Curtis A. Vock, Reg. No. 38,356
4845 Pearl East Circle, Suite 300
Boulder, Colorado 80301
Tel No: (720) 931-3011
Fax No: (720) 931-3001



Printer Friendly

10/687,382 Method of cooling semiconductor die using microchannel thermosyphon

Image File Wrapper

This application is officially maintained in electronic form. To View: Click the desired Document Description. To Download and Print: Check the desired document(s) and click StartDownload.		
Mail Room Date	Document Description	Page Count
04-13-2005	Abandonment	2
07-26-2004	Claims	2
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04-26-2004	Non-Final Rejection	5
04-26-2004	List of references cited by examiner	1
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10-16-2003	Drawings	3
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10-16-2003	Fee Worksheet (PTO-875)	1

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EXHIBIT D



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Application No.: 10/687,382

Examiner:

Filing Date: Oct. 16, 2003

Group Art Unit: 2835

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THERMOSYPHON

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

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EXTENSION FEE	1ST MONTH \$110.00	2ND MONTH \$420.00	3RD MONTH \$950.00	4TH MONTH \$1480.00		\$ 0
OTHER FEES						\$
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Date of Deposit July 26, 2004

I hereby certify that this is being deposited with the United States Postal Service *Express Mail Post Office to Addressee* service under 37 CFR 1.10 on the date indicated above and is addressed to: Commissioner for Patents, Alexandria, VA 22313-1450.

By Melissa R. Smith

Typed Name: Melissa Smith

Respectfully submitted,

Roy Zeighami, et al.

By Peter C. Knops

Peter C. Knops

Attorney/Agent for Applicant(s)

Reg. No. 37,659

Date: July 26, 2004

Telephone No.: (816) 460-5826



PATENT
Attorney Docket No.: 10014777-3
Express Mail Label No.: EL92787367US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Roy Zeighami, et al.	Confirmation No.	2132
Serial No.	10/074,885	Group Art Unit:	2835
Filed:	February 12, 2002	Examiner:	M. Datskovskiy
For:	Method Of Cooling Semiconductor Die Using Microchannel Thermosyphon	Attorney Docket No.	10014777-3

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE & AMENDMENT

Sir:

In response to the examiner's action mailed April 26, 2004, please amend the application as follows:

IN THE CLAIMS begins on page 2 of this paper.

REMARKS begins on page 3 of this paper.

IN THE CLAIMS

1. (Original) A method of cooling a semiconductor die, comprising the steps of:
flowing fluid through micro-channels formed into the die;
communicating fluid from the die to a condenser arranged above the die;
cooling fluid at the condenser; and
communicating fluid from the condenser to the micro-channels.
2. (Original) A method of claim 1, the step of flowing comprising flowing fluid through the micro-channels bounded, at least in part, by a semiconductor element coupled with the die.
3. (Original) A method of claim 2, the semiconductor element comprising one of silicon and a glass plate.
4. (Original) A method of claim 1, further comprising the step of shaping the micro-channels for preferential fluid flow along the micro-channels.
5. (Original) A method of claim 1, the steps of communicating comprising utilizing headers coupled with the micro-channels.
6. (Currently Amended) A method of claim 1, the step of communicating fluid from the condenser to the micro-channels comprising utilizing gravity to force the fluid to the [condenser]die.

REMARKS

It is believed that the following remarks attend to all rejections and objections presented in the pending April 26, 2004 office action; these remarks are numbered with corresponding paragraphs to this office action.

On July 13, 2004, Curtis Vock (counsel for the assignee hereof) called Examiner Datskovskiy because the reference JP 405308111A ("Kuwabara") could not be located in papers sent from the Patent Office. In the teleconferences, Examiner Datskovskiy agreed to fax Kuwabara to Curtis Vock. The facsimile arrived also on July 13, 2004.

CLAIM REJECTIONS UNDER 35 U.S.C. § 112

Claim 6 stand rejected due to an error reciting how gravity affects fluid from the condenser to the die. The Examiner's interpretation of claim 6 is correct and claim 6 is amended to correct the typographical error.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

Claims 1-6 stand rejected as being unpatentable over U.S. Patent No. 4,450,472 ("Tuckerman") in view of Kuwabara. We disagree.

Kuwabara is a foreign language document and the Examiner has specifically relied upon the full text of Kuwabara in citing figures 1-14. See page 3 of the current Office Action. According to MPEP §706.02, if a cited reference document "is in a language other than English and the Examiner seeks to rely on that document, a translation must be obtained so that the record is clear as to the precise facts the examiner is relying upon to support the rejection" (emphasis added). Here, no English translation was supplied (other than an abstract), and yet Applicants are entitled to an English translation so that the exact reasons for the rejection are clear. The abstract supplied with Kuwabara is not cited as the basis for the rejection, nor does it disclose text about every figure 1-14 as specifically referenced by the Examiner. Accordingly the abstract is not sufficient to form the basis for response and the record remains unclear.

Nonetheless, and with regard to Tuckerman, we disagree that Tuckerman discloses what the Examiner sets forth in paragraph 4 of the present action. In particular, Tuckerman teaches a method for heat removal in an integrated circuit using microscopic channels. These channels are formed by fins 14; a cover 20 affixes to the chip 10 so as to form a chamber for coolant flow. See Tuckerman, col. 2, lines 50-61. There is not however any disclosure or teaching within Tuckerman of (a) communicating fluid from the die to a condenser arranged above the die, (b) cooling fluid at the condenser, and (c) communicating fluid from the condenser to the micro-channels – as required by claim 1.

The Examiner relies upon Tuckerman – at col. 4, lines 56-59 - as if this section discloses a condenser; however this is not so. This section merely states that a glass cover 69 defines a coolant chamber with the fins 61; there is no teaching of a "condenser" as disclosed in the present application (and claimed in claims 1-6). Tuckerman does not, further, discuss where tubes 70, 72 connect to; certainly there is no disclosure that they connect to a condenser arranged above a die, as in claim 1. The word "condenser" is entirely absent from Tuckerman.

With respect to the English abstract only, Kuwabara also does not disclose the method steps of claim 1. If the Examiner persists with the rejection of the claims based on Kuwabara, an English translation is hereby requested.

Claims 2-6 depend from claim 1 and benefit from like arguments. But, note also that these claims have additional reasons for patentability, including, for example:

- o Tuckerman does not disclose the step of shaping the micro-channels for preferential fluid flow along the micro-channels as in claim 4. From what can be discerned, Kuwabara also does not disclose feature(s) of claim 4.
- o Tuckerman does not disclose the step of utilizing headers coupled with the micro-channels as in claim 5. Tuckerman in fact teaches away from "headers" since, for example, only empty space of the chamber

connects tubes 70, 72 to fins 61. See Tuckerman, FIG. 7. It would appear that Kuwabara also does not disclose feature(s) of claim 5.

- o Tuckerman does not disclose utilizing gravity to force the fluid to the die, as in claim 6. It would appear that Kuwabara also does not disclose feature(s) of claim 5.

The following is a quotation of from the MPEP setting forth the three basic criteria that must be met to establish a *prima facie* case of obviousness: To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP, §2142, citing *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Clearly, Tuckerman (and, from what can be discerned of Kuwabara) does not teach each and every element of claims 1-6. Therefore, this cited art fails under 35 U.S.C. §103. Reconsideration and allowance of claims 1-6 are now requested. Should any rejections persist, we ask to interview this application.

We have now argued and/or attended to each rejection in the pending office action of April 26, 2004. It is believed that no fees are due in connection with this amendment. If any additional fee is due, please charge Deposit Account No. 08-2025.

By 

Peter C. Knops, Reg. No.: 37,659
LATHROP & GAGE, L.C.
2345 Grand Boulevard, Suite 2400
Kansas City, Missouri 64108
Tele: (816) 460-5826
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KANSAS CITY MO 64108-2603
P. Knops
Cent: 41554 (HP)
Mer: 413289 (Meth of Cooling Semiconductor)

TO: (PLEASE PRINT)
Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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PATENT
Attorney Docket No. 10014777-3
Express Mail Label No. EV413241607US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) Roy Zeighami, et al.
Serial No. 10/687,382
Filed October 16, 2003
For Method Of Cooling Semiconductor
Die Using Microchannel
Thermosyphon

Examiner M. Datskovskiy
Group Art No. 2835
Confirmation No. 2132

April 21, 2005

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

VERIFIED STATEMENT OF EXPRESS MAILING DATE

I declare that, on July 26, 2004, I deposited, with the United States Postal Service, in an envelope "Express Mail, Post Office to Addressee," bearing Label Number EL927873678US, addressed to "Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" and having an express mail certification that I executed, the following papers:

1. Response & Amendment;
2. Transmittal Letter For Response/Amendment; and
3. Two Post Cards.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application of any patent issuing thereon.

April 21, 2005
Dated

Melissa Smith
Melissa Smith



HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P. O. Box 272400
Fort Collins, Colorado 80527-2400

PATENT APPLICATION

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Inventor(s): Roy Zeighami, et al.

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Application No.: 10/687,382

Examiner:

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By Peter C. Knops

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Attorney/Agent for Applicant(s)

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Date: July 26, 2004

Telephone No.: (816) 460-5826

Dear Sir:

Please acknowledge receipt of the following
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Serial No.: 10/074,885, Filed: February 12, 2002
PD No.: 10014777-3, Attorney: William J. Streeter
L&G No.: 413289, Attorney: Curtis A. Vock

Inventor(s): Rocy Zeighami, et al.

Title of Invention: Method Of Cooling Semiconductor Die Using Microchannel Thermosyphon

Pgs.

5

Response & Amendment

1

Transmittal Letter for Response/Amendment

fees of \$0.00 to Deposit Account 08-2025

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5

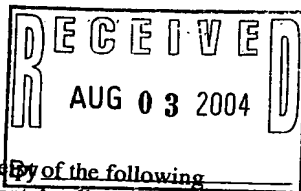
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5 Response & Amendment
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Express Mail No. EL927873678US dated July 26, 2004

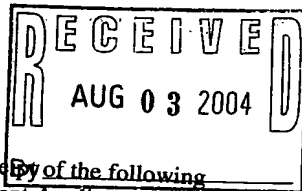


EXHIBIT B

104